

REMARKS

Status

Claims 52-76 are the pending claims in the application. The present amendment does not cancel or add any claims. Accordingly, it is claims 52-76, as now amended, which are at issue.

The Restriction Requirement

In the Office Action mailed November 28, 2007, claims 52-76 were subjected to a restriction requirement. Specifically, the Office Action stated that claims 52-63 were drawn to a method for transferring substances between the layers of a fluid and a gas of interest, and claims 64-76 were drawn to a device for transferring substances between the layers of a fluid or gas of interest. In addition, the Office Action encouraged the Applicant to comment on the references applied in the IPER and point out how the instant claims define over that art.

Election of Invention

Applicant respectfully elects, **with traverse**, the claims including the device for transferring substances between the layers of a fluid or gas of interest, i.e. claims 64-76, with traverse.

Remarks Directed to References Applied in the International Preliminary Examination Report (IPER)

U.S. Patent No. 5,772,900 (Yorita et al.)

U.S. Patent No. 5,772,900 describes an apparatus and a method of reclaiming a used working fluid which has been used in abrasive machining and contains abrasive grains and cutting chips dispersed therein. This used working fluid is processed by a first filter device so that the used working fluid is separated into a reclaimed working fluid which has a low concentration of the cutting chips, and a waste fluid which does not contain the abrasive grains.

The first filter device is shown in FIG. 3 of US 5,772,900. The filter has a pair of punching metal sheets, whose opposed surfaces are covered with respective filtration films; the metal sheets are spaced away from each other by about 10 mm, so as to form a hollow rectangular parallelepiped which gives a chamber therein having a rectangular cross sectional shape. The filter further has a casing in which the above formed rectangular parallelepiped is accommodated, so as to provide a second chamber.

The first chamber and the second chamber of the filter are brought into communication with each other through only the mesh openings of the filtration films and holes formed through each punching metal sheet. The supply passage is connected to an opening of the first chamber while the return passage is connected to a similar opening of the first chamber which is formed on the other end. The casing has a connecting hole formed through the casing. The waste fluid passage is connected to the connecting hole (Col. 15, line 42 – Col. 16, line 7).

The used working fluid is partially discharged into the waste fluid passage through the filtration films of the filter. Since the size of the mesh openings of the filtration films is about 5 microns which is sufficiently smaller than the average grain size of the abrasive grains and is sufficiently larger than the average grain size of the cutting chips, the fluid transmitted through the filtration films does not contain the abrasive grains and contains only the cutting chips. Hereby the waste fluid is discharged into the waste fluid passage, with the cutting chips being dispersed therein (Col. 17, lines 41-51).

The process of discharging the waste fluid into the waste fluid passage is a cross flow filtering step in the meaning that the filtration films have mesh openings which are sufficiently smaller than an average grain size of the abrasive grains. Accordingly, when the used working fluid flows through a circulating path in the device, only the cutting chips are passed through the

mesh openings together with a portion of a medium liquid while the abrasive grains are circulated in the circulating path with the rest of the liquid without deposition on the films.

Thus, US 5,772,900 does not describe a filter of the present invention. The present invention is not based on the principle of cross-flow filtration as described above, where small particles are removed from a solution containing said small particles and larger particles too. Furthermore the present invention when in function is not constructed to or based on a system where a part of the liquid to be filtered passes across a filtration film and into the receiving layer or into the waste fluid passage. If the solution with the small and larger particles of US 5,772,900 was applied to the present invention, both the small and larger particles would all be removed from the liquid, as the receiving layer of the filter of the present invention would allow all the particles to enter into this layer and without the receiving layer being percolated by fluid of the convective layer.

The filter of the present invention as described in claim 1 comprises a convective layer and a receiving layer allowing substances to be transferred to or from said at least one receiving layer without said receiving layer being percolated by said fluid or gas of interest of the convective layer. The filter of US 5,772,900 comprises a first chamber (20), a second chamber (22), which chambers are separated from each other by filtration films (18) (column 14, lines 39-40) and where part of the solution passes these filtration films separating the original stream into a waste fluid and a circulating fluid. Thus the construction of the present filter is different from the filter of US 5,772,900.

The filter of US 5,772,900 does only function if fluid is removed from the neighboring chamber. In the present invention the fluid in the receiving layer does not need to be removed to make the filtration function.

In conclusion both the construction and the function of the present filter differ from that of US 5,772,900. Thus claim 1 and the dependent claims of the present invention are novel in respect of US 5,772,900 and hereby the method claims and device claims do have unity.

Other documents from the IPRP

In the International Preliminary Examination Report the documents US 5,295,583 (Bischofberger et al.) and GB 2,201,355 (Asea Atom AB) are also mentioned.

U.S. Patent No. 5,295,583 (Bischofberger et al.)

The document US 5,295,583 describes a process for cleaning short mineral fibers, in which the fibers contaminated with foreign bodies are separated from the foreign bodies. A liquid with crude mineral fibers and foreign bodies are passed along a filter, through which filter the fibers but not the foreign bodies can pass through. The cleaned fibers together with a part of the liquid passed through the filter are removed from the filter. The cleaned fibers can be collected by simple filtration through a second filter.

The filter of US 5,295,583 has the same construction as that of US 5,772,900: a first chamber and a second chamber, which chambers are separated from each other by filtration films (Fig 1. and Fig. 2). Thus the arguments above regarding US 5,772,900 also regards US 5,295,583 and US 5,772,900 is not novelty destroying for the present invention.

GB 2 201 355 A (Asea-Atom AB)

GB 2201355 describes a porous membrane for separation of undissolved constituents from an aqueous medium by cross-flow filtration. The filter is composed of at least 3 layers of different materials as explained in the abstract.

The filler of GB 2201355 is also working as a cross-flow filter as are the filters of US 5,772,900 and US 5,295,583. The filter of GB 2201355 is in principle constructed of a chamber

leading the contaminated liquid to the filter medium, the filter medium and a chamber leading liquid which has passed the filter away from the filter medium. Hereby the construction of the filter is similar to that of US 5,772,900 and US 5,295,583, and the device of the present invention thus differs from the described filters as described above in respect of US 5,772,900.

In GB 2201355 (and also in US 5,772,100 and US 5,295,583) the entering liquid flow is divided into two flows: the permeate flow – which passes through the dynamic membrane, and another flow – the reject flow – which flows past the dynamic membrane (page 1, lines 16-21). This division of flow is also different from the present invention. In the present invention there need to be a flow in the convective layer, whereas a flow in the receiving layer is not required. The receiving layer may contain stagnant liquid, then no flow is obtained in this layer. In claims 52 and 64 of the present invention the device and method is limited to the feature that the device allowing substances to be transferred to or from the at least one receiving layer without the receiving layer being percolated by the fluid or gas of interest of the convective layer.

In case the filter of the present invention has different flow directions in the convective layer and in the receiving layer the junction of the filter will also be different from that of GB 2201355. In the filter of the present invention the contaminants of the liquid entering the inlet of the convective layer will be transferred to the receiving layer without the fluid entering the inlet percolating the receiving layer. This principle is different from that of GB 2201355, where the liquid pass through a filter to another chamber, thus the liquid is not flowing within the filtering medium parallel to the surface of the filtering medium, but is crossing said filter and flows to another chamber. Thus claim 1 is novel in respect to GB 2201355, and the dependent claims are also novel.

As can be seen from above all the documents mentioned in the IPER describe a different system and a different filtration method as in the present invention. Applicant therefore holds the opinion that the present invention is novel and non-obvious.

Conclusion

In view of the amendments and remarks presented herein, Applicant respectfully submits that claims 64-76 are now in condition for allowance. In addition, Applicant requests that the Examiner consider rejoining claims 52-63 to the application. Any questions, comments or suggestions the Examiner may have which would place the application in still better condition for allowance should be directed to the undersigned attorney.

Dated:

1-28-08

Respectfully submitted,

By 

Ronald W. Citkowski

Registration No.: 31,005

GIFFORD, KRASS, SPRINKLE, ANDERSON
& CITKOWSKI, P.C.

2701 Troy Center Drive, Suite 330

Post Office Box 7021

Troy, Michigan 48007-7021

(248) 647-6000

(248) 647-5210 (Fax)

Attorney for Applicant